epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Design +R Frame

The Norwegian EPD Foundation

Owner of the declaration:
SG Armaturen AS

Product:
Design +R Frame

Declared unit:
1 pcs

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019, EN 50693:2019 and PCR EPD Italy 007.
PCR EPD Italy 007 - Electronic and electrical products and systems - Other electronics

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-9183-8765

Registration number:

NEPD-9183-8765

Issue date: 19.02.2025

Valid to: 19.02.2030

EPD software:
LCAno EPD generator ID: 814959

General information

Product

Design +R Frame

Owner of the declaration:

SG Armaturen AS
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Program operator:

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Manufacturer:

SG Armaturen AS
Skytterheia 25
4790 Lillesand, Norway

Declaration number:

NEPD-9183-8765

Place of production:

SG Armaturen production site FT (China)

, China

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019, EN 50693:2019 and PCR EPD Italy 007.
PCR EPD Italy 007 - Electronic and electrical products and systems - Other electronics

Management system:

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

958560931

Declared unit:

1 pcs Design +R Frame

Issue date:

19.02.2025

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Valid to:

19.02.2030

Year of study:

2023

Functional unit:

1 pcs Design +R Frame manufactured and installed, including waste treatment at end-of-life.

Comparability:

EPD for electronic and electrical products and systems may not be comparable if they do not comply with similar PCR standards.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. NEPDT63

Developer of EPD: Benedikte Ruud Andersen

Reviewer of company-specific input data and EPD: Audun Skare

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools. Approval number: NEPDT78.

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Product

Product description:

Design+R is a slim design frame that fits all SG Install units and mounts perfectly on all wall boxes in the SG Install DK series. All Design+R frames are 100% compatible with the most commonly used wall sockets, sockets, switches and other inserts made for the Danish switch size 45x45mm. The frames are made of color-resistant and antibacterial plastic, which does not fade in color over time, and which helps to keep touch surfaces clean and bacteria-free. The frames' narrow and modern design gives an exclusive finish to the finished wall, and the UV protection on both insert and frame ensures that the color is preserved for many years in the future.

IP Class: IP20. Material: Anti-bacterial UV Resistant PC. Colour: White RAL 9016. Indoor. Length (mm): 59. Width (mm): 186. Height (mm): 9. EAN: 7021985825016.

The EPD also covers the following products:

7021985820011 DESIGN+R FRAME 1M WHITE
7021985820110 DESIGN+R FRAME 1M ANTRACIT
7021985821018 DESIGN+R FRAME 1.5M WHITE
7021985821117 DESIGN+R FRAME 1.5M ANTRACIT
7021985822015 DESIGN+R FRAME 2X1M WHITE
7021985822114 DESIGN+R FRAME 2X1M ANTRACIT
7021985823012 DESIGN+R FRAME 2.5M WHITE
7021985823111 DESIGN+R FRAME 2.5M ANTRACIT
7021985824019 DESIGN+R FRAME 3M WHITE
7021985824118 DESIGN+R FRAME 3M ANTRACIT
7021985825115 DESIGN+R FRAME 3.5M ANTRACIT
7021985826013 DESIGN+R FRAME 2X1.5M HORIZONTAL WHITE
7021985826112 DESIGN+R FRAME 2X1.5M HORIZONTAL ANTRACIT
7021985827010 DESIGN+R FRAME 3X1.5M HORIZONTAL WHITE
7021985827119 DESIGN+R FRAME 3X1.5M HORIZONTAL ANTRACIT
7021985828017 DESIGN+R FRAME 2M HORIZONTAL WHITE
7021985828116 DESIGN+R FRAME 2M HORIZONTAL ANTRACIT

Product specification

Materials	kg	%
Plastic - Polycarbonate (PC)	0,02	100,00
Total	0,02	100,00

Packaging	kg	%
Packaging - Cardboard	0,00	47,23
Packaging - Paper	0,01	52,02
Packaging - Recycled paper	0,00	0,75
Total incl. packaging	0,03	100,00

Technical data:

Declaration data:

Standards:
EN 60669-1:2018 (Switches for household and similar fixed installations).

Link to product data on our website:
https://www.sg-as.com/da/produkter/designrammer/7021985825016/pdf/specifikation_7021985825016.pdf

Market:

Nordic + Northwestern Europe.

Reference service life, product

20 years. Estimated based on the characteristics of the product and the intended application.

Reference service life, building or construction works

60 years. Standard service life for buildings to the PCR Part A of EPD Norway.

LCA: Calculation rules

Declared unit:

1 pcs Design +R Frame

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

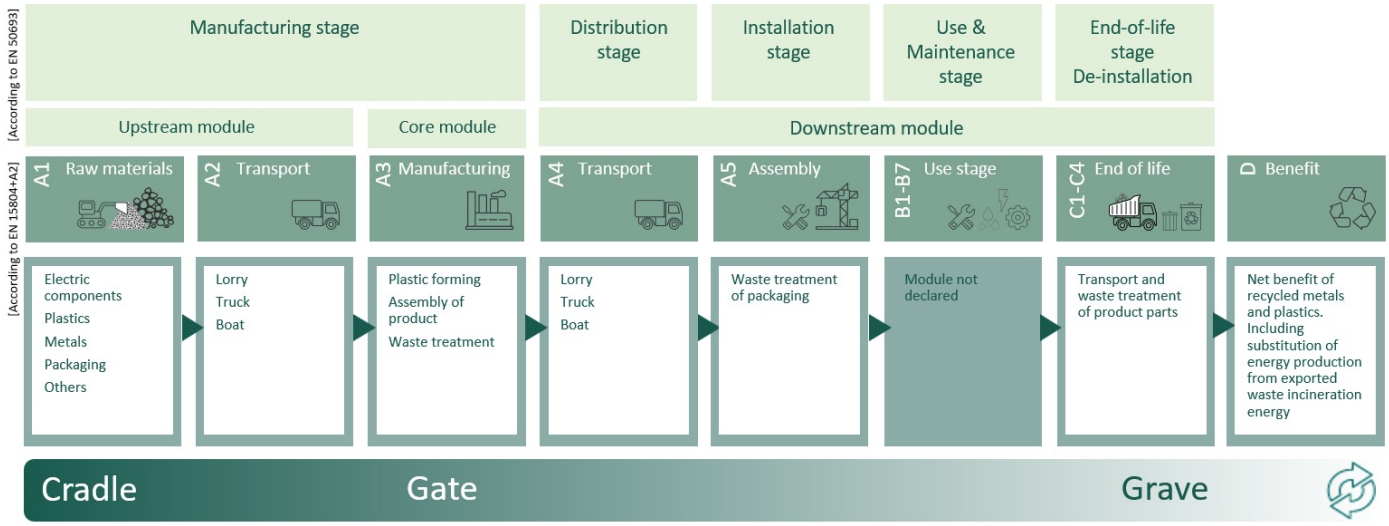
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Packaging - Cardboard	Modified ecoinvent 3.6	Database	2019
Packaging - Paper	ecoinvent 3.6	Database	2019
Packaging - Recycled paper	Modified ecoinvent 3.6	Database	2019
Plastic - Polycarbonate (PC)	Ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Module A4 = Transportation by truck (160 km) from the production site in Shunde, China to the harbor in Shenzhen, China. After this the goods are transported by ship (19330 km) from Shenzhen, China to Hamburg, Germany. Then with a truck (650 km) from Hamburg, Germany to the warehouse in Lillesand, Norway + 800 km for Nordic / Northwestern Europe Market.

Modules A5 = Installation is performed in the Nordic / Northwestern Europe Market and done by manual labor. The use of portable electrical devices such as drills usually have low energy requirements falling under the cut-off criterion of 1% and are therefore neglected (especially for small retail switches, outlets etc.). No product scraps are generated during installation, but the end-of-life treatment of packaging is systematically accounted for in this module.

Module B1-B7 have been excluded since the product(s) covered by this EPD do not contain electronic components.

Module C1 = De-installation is done by manual labor. The use of portable electrical devices such as drills usually have low energy requirements falling under the cut-off criterion of 1% and are therefore neglected (especially for small retail switches).

Module C2 = Transportation from building site to the waste treatment facility with an average distance of 300km.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in EN 50693, Product Category Rules for life cycle assessments of electronic and electrical products and systems, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals, plastics, and electronic components allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Freight, Transoceanic (km)	65,0 %	19330	0,003	l/tkm	57,99
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	1450	0,043	l/tkm	62,35
Truck, 16-32 tonnes, EURO 6 (km) - Rest of World	38,8 %	160	0,044	l/tkm	7,04

Assembly (A5)	Unit	Value			
Waste, packaging, corrugated board box, with recycled content, to average treatment (kg) - A5 including transport	kg	0,0045			
Waste, packaging, kraft paper, unbleached, to average treatment (kg) - Global - A5, incl. 85 km transp.	kg	0,0050			
Waste, packaging, paper printed, 100% recycled content, to average treatment (kg) - Global - A5, incl. 85 km transp	kg	0,000072			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	300	0,043	l/tkm	12,90

Waste processing (C3)	Unit	Value			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	0,0099			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,00034			
Landfilling of plastic mixture (kg)	kg	0,0099			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	0,015			
Substitution of thermal energy, district heating (MJ)	MJ	0,23			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	2,14E-01	1,31E-02	1,67E-02	0	1,44E-03	2,34E-02	1,13E-03	-1,41E-03
	GWP-fossil	kg CO_2 -eq	2,30E-01	1,31E-02	1,55E-04	0	1,44E-03	2,34E-02	1,13E-03	-1,36E-03
	GWP-biogenic	kg CO_2 -eq	-1,56E-02	4,67E-06	1,65E-02	0	5,96E-07	5,09E-07	1,01E-07	-2,80E-06
	GWP-luluc	kg CO_2 -eq	1,44E-04	6,47E-06	5,14E-08	0	5,13E-07	9,50E-08	2,22E-08	-4,68E-05
	ODP	kg CFC11 -eq	5,62E-09	2,89E-09	3,30E-11	0	3,26E-10	5,10E-11	3,10E-11	-9,89E-05
	AP	mol H+ -eq	9,99E-04	1,96E-04	7,36E-07	0	4,14E-06	5,14E-06	7,70E-07	-1,12E-05
	EP-FreshWater	kg P -eq	5,42E-06	8,53E-08	1,28E-09	0	1,15E-08	4,52E-09	1,03E-09	-1,21E-07
	EP-Marine	kg N -eq	1,85E-04	4,72E-05	2,44E-07	0	8,19E-07	2,46E-06	1,45E-06	-3,66E-06
	EP-Terrestial	mol N -eq	2,02E-03	5,25E-04	2,64E-06	0	9,16E-06	2,52E-05	3,06E-06	-3,95E-05
	POCP	kg NMVOC -eq	6,10E-04	1,42E-04	7,58E-07	0	3,51E-06	6,07E-06	1,11E-06	-1,09E-05
	ADP-minerals&metals[1]	kg Sb-eq	1,22E-06	2,54E-07	3,79E-09	0	3,98E-08	2,56E-09	7,53E-10	-1,35E-08
	ADP-fossil[1]	MJ	2,51E+00	1,86E-01	2,18E-03	0	2,18E-02	3,22E-03	2,28E-03	-1,94E-02
	WDP[1]	m^3	4,62E-01	1,19E-01	2,76E-03	0	2,11E-02	2,32E-02	1,93E-02	-2,42E-01

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

The product is compliant with the European RoHS Directive 2011/65/EU on Restriction of the use of certain Hazardous Substances in Electrical and Electronic equipment and with the European REACH regulation (EC) No 1907/2006 on Registration, Evaluation, Authorization and Restriction of Chemicals.

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,55E-08	4,78E-10	1,10E-11	0	8,80E-11	2,20E-11	1,60E-11	-6,77E-10
	IRP[2]	kgBq U235 -eq	2,59E-03	8,03E-04	9,31E-06	0	9,52E-05	8,10E-06	1,10E-05	-1,24E-04
	ETP-fw[1]	CTUe	6,34E+00	1,27E-01	2,90E-03	0	1,61E-02	4,95E-02	2,75E-03	-1,06E-01
	HTP-c[1]	CTUh	7,70E-11	0,00E+00	0,00E+00	0	0,00E+00	1,00E-12	0,00E+00	-2,00E-12
	HTP-nc[1]	CTUh	3,50E-09	9,40E-11	4,00E-12	0	1,80E-11	6,20E-11	2,00E-12	-1,02E-10
	SQP[1]	dimensionless	1,65E+00	9,09E-02	1,46E-03	0	1,52E-02	5,88E-04	8,63E-03	-1,30E-01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	3,21E-01	2,10E-03	3,58E-05	0	3,12E-04	1,79E-04	1,06E-04	-1,20E-01
	PERM	MJ	9,82E-02	0,00E+00	-9,82E-02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	4,19E-01	2,10E-03	-9,81E-02	0	3,12E-04	1,79E-04	1,06E-04	-1,20E-01
	PENRE	MJ	2,00E+00	1,86E-01	2,18E-03	0	2,18E-02	3,22E-03	2,28E-03	-1,94E-02
	PENRM	MJ	5,05E-01	0,00E+00	0,00E+00	0	0,00E+00	-5,05E-01	0,00E+00	0,00E+00
	PENRT	MJ	2,51E+00	1,86E-01	2,18E-03	0	2,18E-02	-5,02E-01	2,28E-03	-1,94E-02
	SM	kg	9,61E-03	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	9,15E-04	6,78E-05	1,19E-06	0	1,12E-05	3,85E-06	2,19E-06	-2,10E-05
	NRSF	MJ	3,98E-04	3,71E-04	4,90E-06	0	3,99E-05	0,00E+00	4,79E-06	-7,11E-03
	FW	m^3	1,90E-03	1,61E-05	1,03E-06	0	2,33E-06	2,72E-05	2,84E-06	-1,44E-04

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	4,64E-04	9,41E-06	0,00E+00	0	1,12E-06	0,00E+00	9,39E-06	-9,12E-07
	NHWD	kg	1,66E-02	5,85E-03	9,61E-03	0	1,06E-03	0,00E+00	9,92E-03	-4,59E-04
	RWD	kg	2,46E-06	1,27E-06	0,00E+00	0	1,48E-07	0,00E+00	1,50E-08	-1,02E-07

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	1,02E-02	0,00E+00	8,94E-03	0	0,00E+00	0,00E+00	8,88E-07	0,00E+00
	MER	kg	1,91E-03	0,00E+00	3,55E-04	0	0,00E+00	9,90E-03	2,17E-08	0,00E+00
	EEE	MJ	2,90E-03	0,00E+00	5,50E-04	0	0,00E+00	1,52E-02	1,41E-06	0,00E+00
	EET	MJ	4,39E-02	0,00E+00	8,32E-03	0	0,00E+00	2,30E-01	2,13E-05	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	4,52E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, China (kWh)	ecoinvent 3.6	1102,91	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

No effect on indoor environment.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	2,27E-01	1,31E-02	1,56E-04	0	1,44E-03	2,34E-02	1,16E-03	-1,39E-03

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

ISO 14025:2010. Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization.
ISO 14044:2006. Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization.
EN 15804:2012+A2:2019. Environmental product declaration - Core rules for the product category of construction products. European Committee for Standardization.
ISO 21930:2017. Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products. International Organization for Standardization.
EN 50693:2019. Product category rules for life cycle assessments of electronic and electrical products and systems. European Committee for Standardization.
Ecoinvent v3, 2019. Allocation, cut-off by classification. Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021). eEPD v2021.09, background information for EPD generator tool system verification, LCA.no. Report number: 07.21. System verification report.
Babwah & Philis (2023). EPD generator based on PCR EPD Italy 007, background information for EPD generator application and LCA data, LCA.no. Report number 09.2023. PCR verification report (based on core PCR).
EPD Italy (2020). PCR EPD Italy 007 Part A for electronic and electrical products and systems. EPD Italy. Version 3, issue 13-01-2023 and valid until 19-01-2025.

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